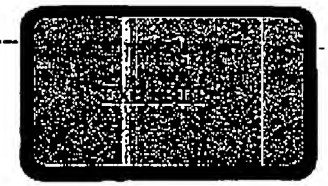
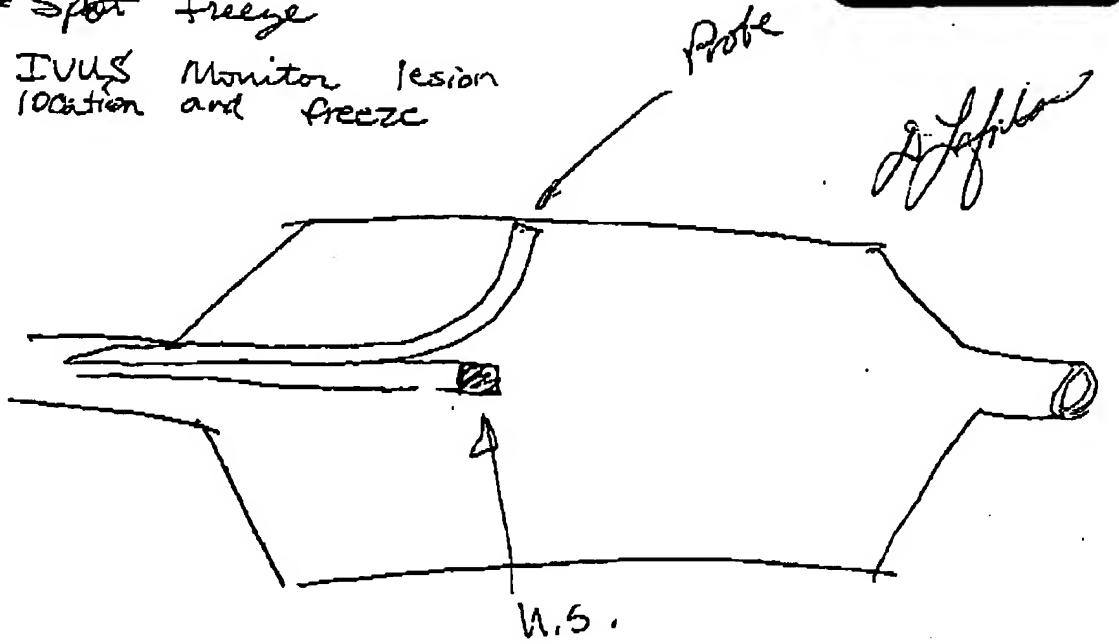
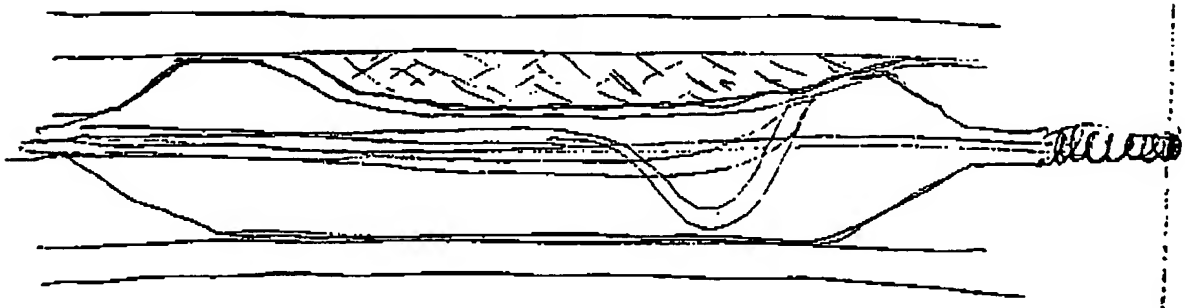


Cryoballoon
= Spot freeze
= IVUS Monitor lesion location and freeze





Diff 1

Key Points to Protect:

1) evaporative cooling
2) wind chill effect

#1 Inflation of balloon with low pressure gas (CO_2), combined with delivery of high pressure cryogen.

#2 as in #1 except that cryogen may be spot applied or eccentrically applied to create localized cooling (spot freezing within a chamber)

#3 as in #2, but where freezing is Guided by visualization including IVUS, OCT, angioscopy, or impedance ~~imaging~~.

#4 Method of evaporative cooling where as in #1 but that a wind chill effect is created by directing the low pressure gas to aid the evaporative cooling of the high pressure cryogen.

L. Hafte

#5 Method of cooling with ligaid CO_2, which utilizes a back-pressure closed system, and prevents the formation of dry ice by keeping the pressure above the triple point for CO_2 of 5.1 atm. Cooling is accomplished by the "boiling" of the ligaid released CO_2, from 56.5 atm to 5.1 atm.

#6 as in #5 where pressure is regulated by an external pressure regulator

#7 as in #5, where release from high pressure to low pressure is accomplished through an orifice

#8 as in #8, where orifice is made of uniform distribution to spray entire inside of cryo chamber

#9 as in #5, where H.P. CO_2 is sprayed to create focal spot cooling as described in #3.